Space Weather Forecast

Issued on Sunday, 30 April 2023 at 13:11 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of R1 Minor - R2 Moderate radio blackouts throughout. Slight chance of G1/Minor geomagnetic storms, mainly Day 3 (02 May).

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity over the past 24 hours has been Low, with occasional Common-class flares. There are currently five sunspot regions on the visible disc. The largest and most complex region on the disc is in the southwest quadrant, with some clear magnetic complexity in the intermediate spots. There is another region in close proximity to this which may also help to increase magnetic instability. A further region in the northeast has seen slight growth in its northern spots, with some weak magnetic complexity forming in the trailing spot. The remaining regions are small and more simple at present.
There have been various mainly weak and faint eruptions appearing in coronagraph imagery in the last 24 hours. Generally speaking, any Coronal Mass Ejections (CMEs) are considered most likely to miss Earth, although some glancing influence from several different sources cannot be ruled out in the coming days. As a result, the forecast should be considered of lower than average confidence at present.

Solar Wind / Geomagnetic Activity: The solar wind was reflective of a waning coronal hole fast wind. The wind speed started the period at strong levels, mainly between 580-720km/s, easing to become elevated around 500 km/s. The Interplanetary Magnetic Field was weak, with the north-south component also varying weakly. Geomagnetic activity was Quiet to Active (Kp 1-4).

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is likely to remain Low, with a chance of reaching Moderate levels through the coming days.

Solar Wind / Geomagnetic Activity: There are several CMEs in the forecast which are mostly expected to miss Earth, but with the possibility of some glancing influence at various times throughout the forecast period. The CME with the highest chance to glance Earth may give some weak influence later on Day 3 (02 May). This is still low confidence, however. Otherwise, the current coronal hole fast wind is slowly starting to wane, and this should continue to ease further through the coming 24 hours. However, a further fast wind may give some limited influence, perhaps prolonging slightly elevated wind speeds into Days 2 and 3 (01-02 May), before a more sustained reduction.
Geomagnetic activity is expected to be Quiet to Unsettled, with a chance of Active intervals on Day 1 under waning fast wind influence and again on Day 3, should we see any CME influence. There is a slight chance of G1/Minor Storms, mainly on Day 3.

Energetic Particles / Solar Radiation: Overall no solar radiation storms are expected, but there is a slight chance of a storm occurring, mainly due to the two larger spots.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	5	20	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	40	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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